CLAIMS

What is claimed is:

- 1. An electronic device, comprising:
 - a substrate having a trench with a lower portion and a top portion; and
 - wherein the lower portion of the trench is filled with a cured spin-on compound, and the top portion is filled with a chemical vapor-deposited compound.
- 2. The device of claim 1 wherein the substrate has a surface that is substantially coplanar with a top surface of the chemical vapor-deposited compound.
- 3. The device of claim 2 wherein the trench further comprises a thermal oxide coat.
- 4. The device of claim 3 wherein the trench has an aspect ratio (depth/width) of no less than 5.
- 5. The device of claim 3 wherein the trench has an aspect ratio (depth/width) of no less than 8.
- 6. The device of claim 1 wherein the spin-on compound comprises silicon.
- 7. The device of claim 1 wherein the spin-on compound is formed from at least one compound selected from the group consisting of methylsilsesquioxane, hydrogensilsesquioxane, methylhydridosilsesquioxane, silicate, and perhydrosilazane.
- 8. The device of claim 1 wherein the chemical vapor-deposited compound comprises silicon.
- 9. The device of claim 1 wherein the chemical vapor-deposited compound is formed from silane or tetraethylorthosilicate.
- 10. The device of claim 1 wherein the trench has a depth, and wherein the lower portion of the trench extends up to 60% of the depth.
- 11. The device of claim 1 wherein the trench has a depth, and wherein the lower portion of the trench extends up to 80% of the depth.

- 12. A method of forming a shallow trench isolation structure, comprising:
 - forming a trench in a substrate having a surface, and depositing a first compound into the trench using spin-on deposition;
 - partially removing the first compound from the trench such that an upper surface of the compound is below the surface of the substrate; and
 - depositing a second compound onto the substrate surface and onto the upper surface of the first compound by chemical vapor deposition.
- 13. The method of claim 12 further comprising planarizing the isolation structure such that the surface of the substrate and an upper surface of the second compound are substantially coplanar.
- 14. The method of claim 12 wherein the substrate surface and the trench further comprise a thermal oxide coat.
- 15. The method of claim 13 wherein the trench has an aspect ratio (depth/width) of no less than 5.
- 16. The method of claim 12 further comprising curing the first compound to form an oxide.
- 17. The method of claim 12 wherein the step of partially removing comprises a process selected from the group consisting of aspin-rinse process, a wet etch process, and a dry etch process.
- 18. The method of claim 12 wherein the first compound is formed from at least one compound selected from the group consisting of methylsilsesquioxane, hydrogensilsesquioxane, methylhydridosilsesquioxane, silicate, and perhydrosilazane.
- 19. The method of claim 12 wherein the second compound is formed from tetraethylorthosilicate or silane.

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20. A method of removing a spin-on compound, comprising:

spin-depositing a spin-on compound on a surface of a substrate; and

- spin-rinsing the spin-on compound with a solvent mixture, wherein the solvent mixture comprises a first solvent that dissolves the spin-on compound, and a second solvent that is inert to the spin-on compound.
- 21. The method of claim 20 further comprising heating the substrate to a first temperature to remove the solvent mixture, and further heating the substrate to a second temperature to cure the spin-on compound.
- 22. The method of claim 20, wherein the spin-on compound comprises silicon, wherein the first solvent comprises propyl acetate, and wherein the second solvent comprises ethyl lactate.
- 23. The method of claim 20, wherein the spin-on compound comprises silicon, wherein the first solvent is selected from the group consisting of a ketone, an ester, an ether, a hydrocarbon, and wherein the second solvent is selected from the group consisting of water, an alcohol, acetonitrile, an amine, and an amide.